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Assessment of Other Finfish in NAFO Subarea 1

by

Christoph Stransky

Federal Research Centre for Fisheries, Institute for Sea Fisheries
Palmaille 9, D-22767 Hamburg, Germany
stransky.ish@bfa-fisch.de

Abstract

The NAFO Scientific Council was requested to provide advice on management for any stock of finfish in Subarea 1 of commercial interest, for which data allow a status report. Under this item, available survey data for the stocks of American plaice, Atlantic and spotted wolffish and thorny skate were analysed which contributed major parts to the demersal fish assemblage off West Greenland. Despite gradually increasing recruitment since the 1980's, no increase in Atlantic wolffish SSB has been observed. The recent increase in recruitment of American plaice has not yet resulted in any increase in SSB. Both spotted wolffish and thorny skates have exhibited declines since the 1980s and the biomass indices remained at very low levels in 2000. Based on the above STACFIS has concluded that the status of these stocks remains severely depleted. Taking the poor stock status of American plaice, Atlantic wolffish, spotted wolffish and thorny skate into account, even low amounts of fish taken and discarded by the shrimp fishery might be sufficient to retard the recovery potential of these stocks. The continued failure of the recruits to rebuild the spawning stocks indicate high mortality rates in excess of the sustainable level. The probability of stock recovery would be enhanced by minimising the by-catch of finfish in SA1 to the lowest possible level.

1. Introduction

The NAFO Scientific Council was requested to provide advice on management for any stock of finfish in Subarea 1 of commercial interest, for which data allow a status report. Under this item, available survey data for the stocks of American plaice, Atlantic and spotted wolffish and thorny skate were analysed which contributed major parts to the demersal fish assemblage off West Greenland.

2. Description of the Fisheries

Historically, catches of Greenland cod (*Gadus ogac*), American plaice (*Hippoglossoides platessoides*), Atlantic wolffish (*Anarhichas lupus*), spotted wolffish (*A. minor*), thorny skate (*Raja radiata*), lumpsucker , Atlantic halibut (*Hippoglossus hippoglossus*) and sharks are mainly taken by offshore trawl fisheries directed to shrimp, cod, redfish and Greenland halibut. Fisheries have also been prosecuted by longliners operating both inshore and offshore and by pound net and gillnet fisheries in inshore areas only. From 1 Oct 2000, sorting grids are obligatory for the shrimp fisheries and will hopefully reduce the amount of by-catches of young finfish.

3. Catches

For the period 1993-2000, catches were listed in Table 1. The values were adopted from the Denmark/Greenland research report (Siegstad, 2001). For 1999 and 2000, no nominal catch figures are given. Estimated catches of other finfish in 2000 amounted to 3 046 tons, representing a decrease of about 2 000 tons compared to the 1999 catch. This was mainly caused by the lack of catch figures for Greenland cod which has been about 1 700 to 1 900 tons in 1997-1999. While the estimated catch for lumpsucker in 2000 (3 000 tons) is of the same order as in 1999 (3 057 tons), catches of wolffish increased by 17 % compared to 1999, amounting to 37 tons in 2000. Atlantic halibut catches in 2000 were estimated 9 tons, representing a significant increase compared to 1999 (<1 ton), but only amounting to one third to one fourth of the catches recorded in 1993-1998.

The catch figures do not include the weight of fish discarded by the trawl fisheries directed to shrimp.

4. Assessment

Due to a lack of adequate commercial data no analytical assessment could be formulated. Therefore, the assessment was based on survey indices.

4.1. Input Data

4.1.1. Commercial fishery data

No data on CPUE, length and age composition of the catches were available. Length frequencies derived from the Greenland shrimp survey revealed that the shrimp trawl was capable of catching all predominant fish sizes (Engelstoft and Jørgensen, 2001). No quantitative information on the amount of juvenile redfish in the by-catches of the shrimp fishery was available for 2000.

4.1.2. Survey data

EU-German groundfish survey. Annual abundance and biomass indices were derived from stratified-random bottom trawl surveys commencing in 1982. These surveys covered the areas from the 3-mile limit to the 400 m isobath of Div. 1B to 1F, and were primarily designed for cod as target species. Biomass estimates for American plaice, Atlantic wolffish, spotted wolffish and thorny skate remained severely depleted after severe declines until 1991. Recently, some stocks showed increased recruitment which did not yet resulted in a significant increase in the mature biomass (Fig. 1-5).

Greenland-Japan and Greenland deep-sea surveys. During 1987-95, cooperative trawl surveys directed to Greenland halibut and roundnose grenadier have been conducted on the continental slope in Div. 1A-1D at depths between 400 and 1 500 m. This Greenland-Japan deep-sea survey was discontinued in 1996. From 1997, a Greenland survey was initiated with another vessel and changed gear (Jørgensen, 2001). In 1999, estimates of biomass indices for American plaice were very low and amounted to 135 tons (Fig. 1). No data for American plaice for 2000 were available.

Greenland groundfish/shrimp survey. Since 1988, a shrimp survey was conducted by Greenland covering the Div. 1A to 1F down to 600 m depth (Engelstoft and Jørgensen, 2001). Due to changes in survey strategy and sampling of fish, determinations of abundance and biomass indices and length composition were considered comparable since 1992. Abundance and biomass indices of American plaice, Atlantic wolffish, spotted wolffish and thorny skate were very low (Fig. 1). All stocks mentioned were dominated by juveniles as derived from length measurements.

4.2. State of the stocks

American plaice SSB was derived from German length disaggregated abundance indices to which a length-maturity ogive was applied (Lloret, 1997). During 1982-91, the SSB decreased drastically to depletion without a significant increase since then (Fig. 2). Recruitment is presented as abundance of small fish 15-20 cm representing age group 5

and indicates an increase to the average level in 1997 and 1998. In 1999 and 2000, the recruitment decreased again. Indications for reduced probability of recruitment at low SSB can be derived from the recruitment-SSB plot (Fig. 3).

The estimation of Atlantic wolfish SSB and recruitment was performed in the same manner as for American plaice, i.e. using a length-maturity ogive and fish of 15-20 cm representing 3 year old recruits (Möller and Rätz, 1998). Since 1982, the SSB decreased drastically and remains severely depleted since the early 1990's (Fig. 4). In contrast, recruitment increased almost continuously over the time series but varied considerably since 1995. However, the abundant recruits did not contribute significantly to the SSB (Fig. 5).

Biomass indices for spotted wolffish and thorny skate, derived from the German groundfish survey and the Greenland shrimp/groundfish survey, show a weak increase in 2000.

4.3. **Assessment results**

Despite gradually increasing recruitment since the 1980's, no increase in Atlantic wolffish SSB has been observed. The recent increase in recruitment of American plaice has not yet resulted in any increase in SSB. Both spotted wolffish and thorny skates have exhibited declines since the 1980s and the biomass indices remained at very low levels in 2000. Based on the above STACFIS has concluded that the status of these stocks remains severely depleted. Taking the poor stock status of American plaice, Atlantic wolffish, spotted wolffish and thorny skate into account, even low amounts of fish taken and discarded by the shrimp fishery might be sufficient to retard the recovery potential of these stocks. The continued failure of the recruits to rebuild the spawning stocks indicate high mortality rates in excess of the sustainable level. The probability of stock recovery would be enhanced by minimising the by-catch of finfish in SA1 to the lowest possible level. The application of obligatory sorting grids since 1 Oct 2000 will hopefully help to reduce these by-catches. Results of experimental fishing with 22mm sorting grids show a nearly complete protection to finfish larger than about 20 cm, but poor protection of the smallest fish (Engelstoft *et al*. 2001).

4.4. **Reference points**

Due to a lack of appropriate data, STACFIS was unable to propose any limit or buffer reference points for fishing mortality or spawning stock biomass for American plaice, Atlantic wolffish, spotted wolffish, and thorny skate in Subarea 1. Nevertheless, the recently depleted spawning stocks as derived from survey results are considered far below appropriate levels of B_{lim}.

References

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Table 1 Official annual nominal catches of other finfish in Subarea 1 (Siegstad, 2001).

Nominal reported catches (tons) are as follows:

Species	1993	1994	1995	1996	1997	1998	1999[1]	2000[1]
Greenland cod	1 896	1 854	2 526	2 117	1 729	1 717	1 899	no data
Wolffishes	157	100	51	47	68	30	26	37
Atlantic halibut	43	38	23	34	22	22	<1	9
Lumpsucker	246	607	447	425	1 158	2 143	3 057	3 000
Sharks	10	34	46	135	no data	no data	no data	no data
Non-specified finfish	411	643	618	609	1 269	588	no data	no data
Sum	2 763	3 276	3 711	3 367	4 246	4 500	4 983	3 046

[1]Estimated

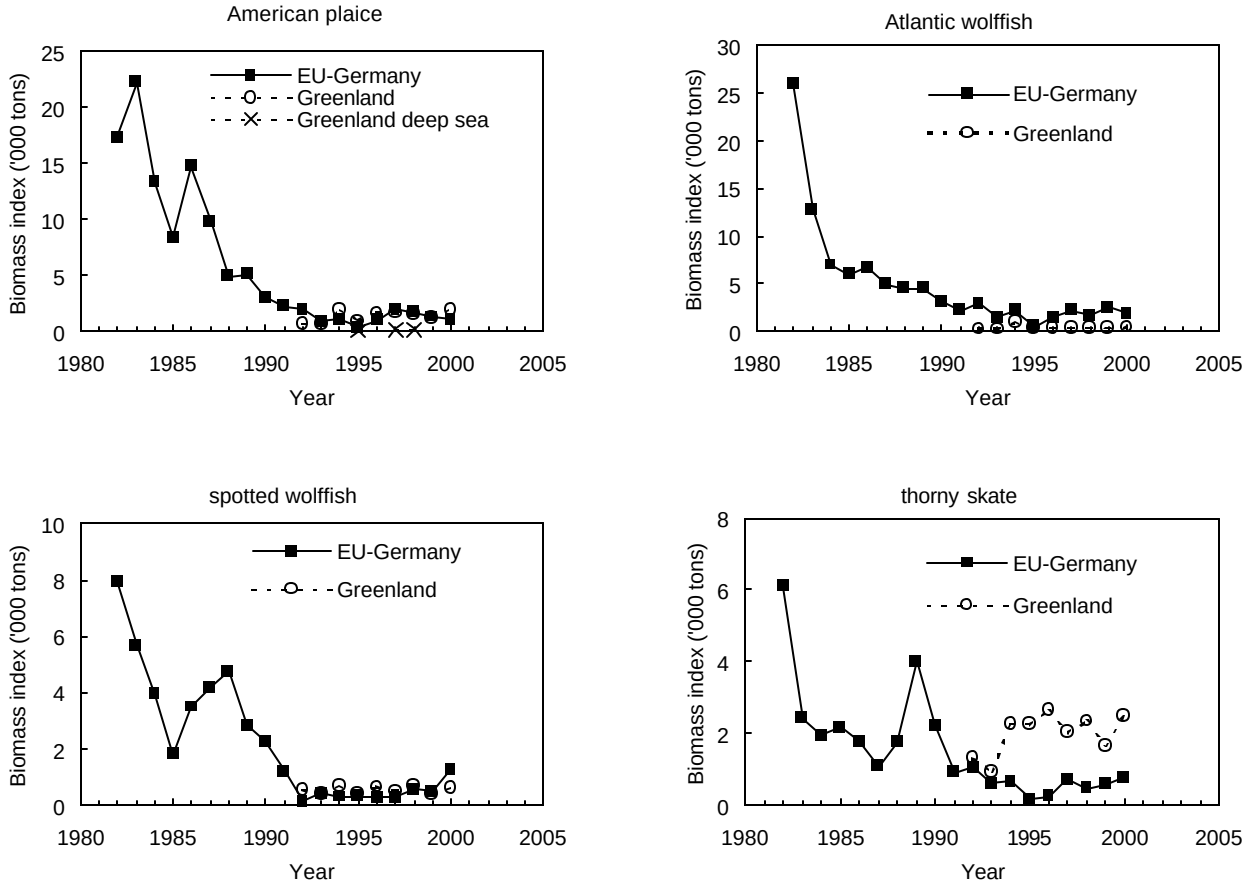

Fig. 1. Finfish in Subarea 1: Estimates of biomass indices from German groundfish surveys and the Greenland shrimp/groundfish survey for American plaice, spotted and Atlantic wolffish and thorny skate.

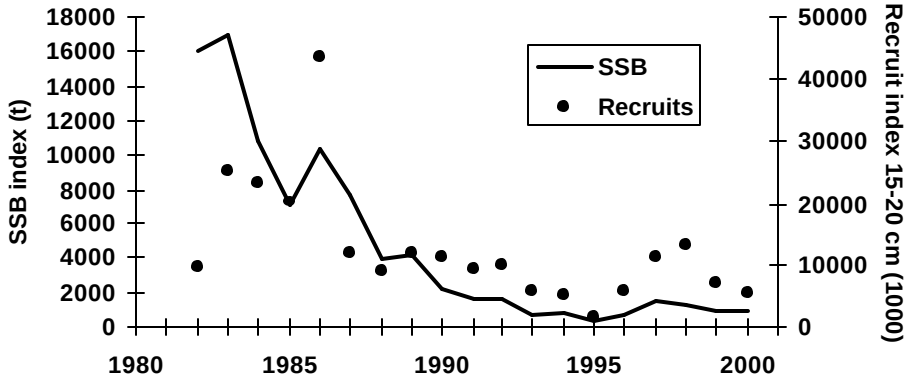

Fig. 2. American plaice Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.

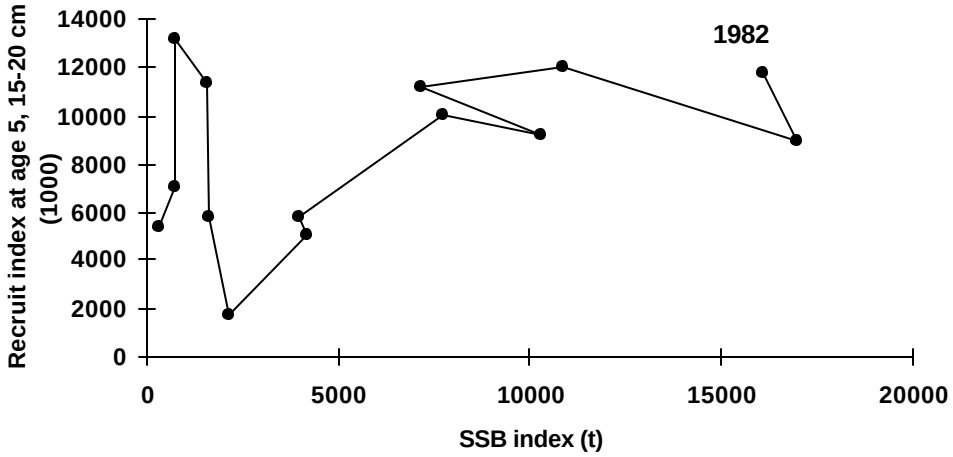

Fig. 3. American plaice Subarea 1. SSB-recruitment plot.

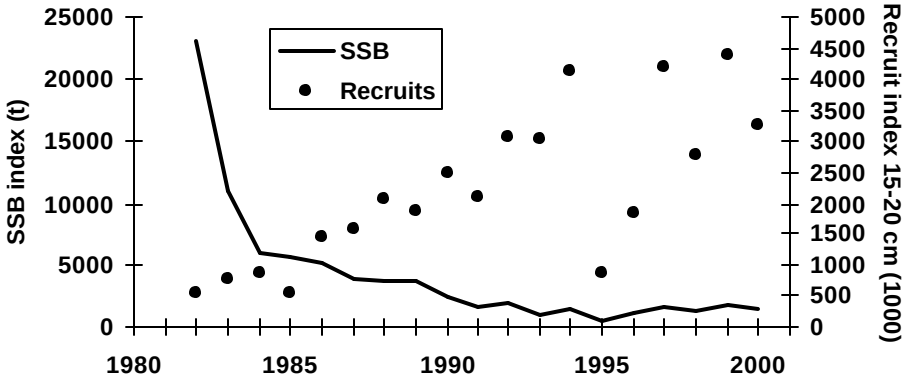

Fig. 4. Atlantic wolffish Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.

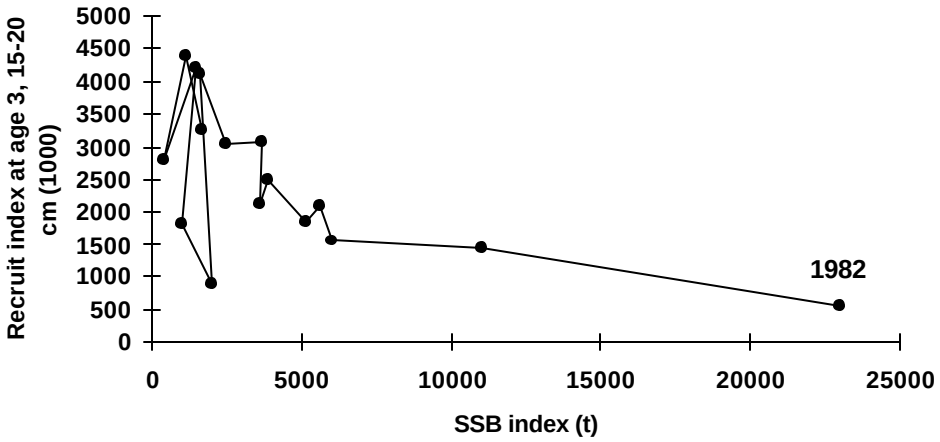

Fig. 5. Atlantic wolffish Subarea 1. SSB-recruitment plot.